Draft Libby OU4 Remedial Action Objectives

- Reduce current and future exposure to sources of Libby amphibole.
- Reduce upper bound lifetime cancer risk to Libby residents from inhalation of Libby amphibole to between 1 x 10-4 and 1 x10-6 for *each* identified exposure pathway. All exposure pathways result from direct or indirect disturbance of various contaminated media including, but not necessarily limited to, soil, dust, vermiculite products, and vermiculite-related waste materials.
- Could add an RAO addressing cumulative exposure and risk, but I'm not sure a cumulative risk value is measurable or a cumulative 1x10-4 standard is achievable.
- Could add an RAO addressing non-cancer risk, but not sure how it would be worded or if it would be of value.
- Educate residents, businesses, and local government on an ongoing basis about the hazards of vermiculite and Libby amphibole. Provide ongoing information, guidance, training, and tools that facilitate identification of asbestos containing materials, proper handling & disposal of asbestos containing materials, and reduction of residual risks.
- Limit future management requirements. Ensure residents, businesses, and local governments are not subject to administrative, financial, or regulatory burdens that are grossly inconsistent with other locations. Not sure how we will evaluate this or how it will be measured.

There are four important factors that EPA considered when establishing RAOs. These factors must also be considered and balanced when determining what remedy is practicable and warranted at the Libby Asbestos Site.

- Past and current residents of the Libby area represent a sensitive, previously exposed population. At this time, it is not possible to quantify the magnitude of past exposures, but the high disease rate observed among residents with no direct ties to vermiculite processing operations, as well as the site history and monitoring data, suggest that non-occupational exposures alone were sufficient to cause substantial respiratory health impacts. In other words, the large-scale nature and long-term duration of past exposures, coupled with the demonstrated toxicity of Libby asbestos, merits aggressive and thorough action beyond what might be considered sufficient elsewhere. Efforts to quickly eliminate exposure pathways and minimize any additional exposures are warranted wherever possible.
- It is reasonable to conclude that the majority of exposures at the Site were, and still are, caused by use and disturbance of vermiculite waste materials and releases associated with vermiculite processing operations. However, some of the exposures at the Site were, and still are, due to commercial vermiculite products that were distributed and used nationally. The multiple exposure pathways associated with *both* of these categories of sources, which are often indistinguishable, are thought to be a major reason for the high disease rates observed in current and former Libby residents.

Asbestos-containing commercial products, including Libby vermiculite products, are present in millions of buildings and yards across the county. Asbestos, especially chrysotile asbestos, is ubiquitous in developed areas. There are naturally occurring deposits of asbestos in several states. Using current science as a standard, most existing regulatory programs designed to prevent asbestos exposure are insufficient to adequately protect public health. Consequently, it is likely that millions of people across the nation, most completely unaware of their exposure, face potential risks from asbestos exposure that may not be considered acceptable under Superfund. This is supported by the prevalence of asbestos related disease in the U.S. Given the complexity and cost of asbestos cleanup, it is unreasonable to believe that these widespread exposures and risks can be completely addressed anytime in the foreseeable future. Some degree of asbestos exposure will remain a fact of life in the near future.

- Significant technical limitations and scientific uncertainties remain regarding asbestos measurement and risk assessment. These limitations and uncertainties are unlikely to be completely overcome in the near future. EPA considered the magnitude and complexity of the problem in Libby and determined that it was unacceptable to wait for further resolution prior to taking aggressive emergency response action. When evaluating which actions to take, EPA considered both the current science and the amount of resources available and made informed, weight of evidence decisions. The same approach is necessary, albeit to a lesser degree, with future remedial actions. As the science of asbestos evolves, it may be necessary to reexamine some actions taken during all phases of the Libby response. The Superfund law was established with this fact in mind and provides for ongoing evaluations of a remedy's protectiveness.